

[4910-13-U]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39 [66 FR 12726 2/28/2001]

[Docket No. 98-ANE-57-AD; Amendment 39-12124; AD 2001-04-06]

RIN 2120-AA64

Airworthiness Directives; CFM International, S.A. CFM56-3, -3B, and -3C Series Turbofan Engines

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD) that is applicable to CFM International, S.A. CFM56-3, -3B, and -3C series turbofan engines. This amendment requires that use of certain lubricants no longer on the manufacturer's approved list be discontinued. In addition, this amendment requires a one-time fan disk dovetail wear measurement, and if wear exceeds certain limits, requires an ultrasonic inspection for cracks in the fan disk, and, if necessary, removal from service of fan disks and replacement with serviceable parts. This amendment is prompted by reports of fan disk heavy wear and cracks. The actions specified by this amendment are intended to prevent fan disk failure, which could result in an uncontained engine failure and damage to the aircraft.

DATES: Effective date April 4, 2001. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of April 4, 2001.

ADDRESSES: The service information referenced in this AD may be obtained from CFM International, Technical Publications Department, 1 Neumann Way, Cincinnati, OH 45215; telephone (513) 552-2800, fax (513) 552-2816. This information may be examined at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA, or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT: Glorianne Niebuhr, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7132, fax (781) 238-7199.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an airworthiness directive (AD) that is applicable to CFM International S.A. CFM56-3, -3B, and -3C Series Turbofan Engines was published in the Federal Register on March 3, 2000 (65 FR 11505). That action proposed to require a one-time fan disk dovetail wear measurement, and if wear exceeds certain limits, require an ultrasonic inspection for cracks in the fan disk, and, if necessary, require removal from service of fan disks and replacement with serviceable parts. That action was prompted by reports of fan disk heavy wear and cracks. That condition, if not corrected, could result in an uncontained engine failure and damage to the aircraft.

Comments Received

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received.

Compliance Intent

One commenter suggests that the compliance intent of the AD would be met if an operator accomplished Boeing task card C72-31-02-2A-1 or -2, and Boeing Aircraft Maintenance Manual (AMM) 72-31-02, tasks on page 601. The FAA disagrees. The Boeing task card only describes the procedure for

lubricating fan blade dovetails. In addition, the AMM does not lead the operator to perform ultrasonic inspection and does not explain how to gain serviceability.

When Inspection is not Required

One commenter suggests that the information contained in paragraphs 1.A. (1) and (2) of CFMI SB 72-854, Revision 2, should be added to the AD to clarify when the inspection is NOT required. The FAA partially agrees. The information is already included in the flowcharts in the referenced SB. However, to further clarify when an inspection is NOT required, information has been added to new paragraphs (h), (i) and (j) of this AD.

Requirements of Revision 1 and Revision 2

One commenter is concerned that the requirements of CFMI CFM56-3 SB 72-854 Revision 1 and CFMI CFM56-3 SB 72-854 Revision 2 are different and that the AD will result in another round of inspections after they have already been done according to Revision 1. Other commenters want to be sure that credit will be given for performing Revision 1 of the SB. The FAA partially agrees and clarification has been added to the AD to allow Revision 1 as a method of compliance. There is no technical difference between Revision 1 and 2. Revision 2 simply adds flowcharts for clarification.

Clarification of Wear Limits

One commenter states that the wear limits in the SB are inconsistent with the wear limits in the AD (.004 inch vs. .005 inch). The FAA does not agree. There is no difference between the AD and the SB. The two measurements noted (.004 and .005) are applied in different contexts. The .004 inch limit in SB paragraph 1.A.(2) refers to the last inspection performed in accordance with the engine shop manual and is one of the conditions required to avoid the inspection per the AD. However, the .005 inch limit is a result of the on-wing inspection required by the AD to determine if the disk is serviceable or if further inspections are necessary.

Inspection Parameters

One commenter asks that the second bullet in paragraph 1.A of the SB, which states that for "fan disks relubricated with a currently recommended lubricant, inspection of these disks is due at 20,000 cycles-since-new (CY)/35,000 hours-since-new (H) threshold-since-new or rebroached," be added to the compliance section of the AD to clarify when it is possible to wait until 20,000 cycles to perform the inspection. The FAA agrees with the intent of the second bullet in paragraph 1.A of the SB and clarification has been added to new paragraph (k) of the compliance section to further explain when it is possible to wait until 20,000 cycles to inspect.

Rebroached Fan Disks

The manufacturer asks that a statement be added to the effectivity section of the AD that rebroached fan disks do not require an inspection per this AD. The FAA agrees and has added new paragraph (i) to the AD, stating that inspections will not be required for rebroached fan disks.

Where to Perform the Inspection

One commenter requests that the fan disk inspections be performed at the shop visit level instead of on-wing. The commenter further states that there is a low failure rate and incidents that occurred resulted from the use of an uncommon lubricant. The FAA does not agree. The lubricant being discontinued was an approved lubricant. The lubricant has since been taken off of the approved lubricant list. But before that time, any and all operators had the possibility of being exposed. As stated in SB paragraph 1. A. (1), if the fan disk has used a CURRENTLY approved lubricant and has the recommended configuration installed before 3,000 cycles/5250 hours, inspection is not required. Otherwise inspection per the AD is necessary to maintain a minimum acceptable level of safety. In addition, a cracked fan disk could lead to an uncontained failure. The risk analysis shows that the control program described in this AD meets the minimum level of safety.

Labor requirement

One commenter asks the FAA to add two hours for ultrasonic inspection to the labor requirement. The FAA does not agree. The two hours for ultrasonic inspection is already included in the estimated nine man-hours detailed in the AD. It is also spelled out in detail in paragraph 1.F.(4) of the SB.

Availability of Blade Replacements

One commenter asks that the FAA revise the on-wing inspection requirement to a shop visit when it is necessary to install the 37° fan blades. The commenter is concerned that blades are not always available and down time may result. The FAA does not agree. The manufacturer has informed the FAA that all parts should be readily available for purchase and installation. In addition, this method meets the minimum acceptable level of safety necessary for this program.

Wear Measurement Tool

One commenter, who questions the accuracy and repeatability of the measuring tool with respect to the allowable max wear limit of .005 inch, asks that the FAA consider eliminating the wear measurement tool in the inspection process. The FAA does not agree. The current wear measurement tool is acceptable for this inspection program. This issue was addressed in the beginning of the program. The .005 inch wear limit takes into consideration the accuracy and repeatability factor. In addition, new improvements have since been introduced to this tool and courses have been provided to explain how to use it properly. Repeatability and reproducibility tests were performed in overhaul shops in 1997. This is the current best practice that is compatible with existing maintenance constraints and practices.

Concurrence As Written

One commenter concurs with the AD as written. After careful review of the available data, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes described previously. The FAA has determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Regulatory Impact

This proposal does not have federalism implications, as defined in Executive Order 13132, because it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Accordingly, the FAA has not consulted with state authorities prior to publication of this proposal.

For the reasons discussed above, I certify that this action (1) is not a “significant regulatory action” under Executive Order 12866; (2) is not a “significant rule” under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) if promulgated, will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. A copy of the draft regulatory evaluation prepared for this action is contained in the Rules Docket. A copy of it may be obtained by contacting the Rules Docket at the location provided under the caption “ADDRESSES.”

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§39.13 [Amended]

2. Section 39.13 is amended by adding the following new airworthiness directive:

AIRWORTHINESS DIRECTIVE



Aircraft Certification Service
Washington, DC

U.S. Department
of Transportation
**Federal Aviation
Administration**

We post ADs on the internet at "av-info.faa.gov"

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

2001-04-06 CFM International: Amendment 39-12124. Docket 98-ANE-57-AD.

Applicability: CFM International, S.A.(CFMI) CFM56-3, -3B, and -3C series turbofan engines, installed on but not limited to Boeing 737 series aircraft.

Note 1: This airworthiness directive (AD) applies to each engine identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For engines that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (l) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated, unless accomplished previously.

To prevent fan disk failure, which could result in an uncontained engine failure and damage to the aircraft, accomplish the following:

Wear Measurement (Thrust Rating Category A Only)

(a) For CFM56-3, -3B, and -3C series engines operating at the category A thrust rating on the effective date of this AD that have never previously operated at the category B or C thrust ratings, perform a one time fan disk dovetail wear measurement in accordance with section 2.B. (1) of Service Bulletin (SB) CFMI CFM56-3/-3B/-3C, No. 72-854, Revision 1, dated August 7, 1998, or section 2.B.(1) of SB CFMI CFM56-3/-3B/-3C, No. 72-854, Revision 2, dated November 29, 1999, using the intervals defined in section 1.D.(1)(a)(1) and 1.D.(1)(a)(2) of the SB's, and the current fan disk time and cycles on the effective date of the AD.

Inspection

(1) Perform a local ultrasonic inspection for cracks in the fan disk in accordance with section 2.B.(2) of the SB, if required by the wear criteria described in section 1.D.(1)(b)1 of the SB.

Removal

(i) Remove from service prior to further flight fan disks that do not meet the ultrasonic inspection criteria defined in paragraph 2.B.(2) (d) 8b of the SB, and replace with a serviceable part.

(ii) Remove from service within 50 cycles-in-service (CIS), fan disks that meet the ultrasonic inspection criteria defined in paragraph 2.B.(2) (d) 8b of the SB, if the wear measurement is greater than or equal to 9 mils.

(2) Install dampers, as required, in accordance with the compliance times and criteria described in section 1.D.(1)(b)1 of the SB.

Wear Measurement (Thrust Rating Category A, if the Engine was Previously Operated at Thrust Rating Categories B or C)

(b) For CFM56-3, -3B, and -3C series engines operating at the category A thrust rating on the effective date of this AD that have previously operated at the category B or category C thrust ratings, perform a one-time fan disk dovetail wear measurement in accordance with section 2.B.(1) of SB CFMI CFM56-3/-3B/-3C, No. 72-854, Revision 1, dated August 7, 1998, or section 2.B.(1) of SB CFMI CFM56-3/-3B/-3C, No. 72-854, Revision 2, dated November 29, 1999, using the intervals defined in section 1.D.(1)(a)(1) and 1.D.(1)(a)(2) of the SB's, and the current fan disk time and cycles on the effective date of the AD.

Inspection

(1) Perform a local ultrasonic inspection for cracks in the fan disk in accordance with section 2.B.(2) of the SB, if required by the wear criteria described in section 1.D.(1)(b)2 of the SB.

Removal

(i) Remove from service prior to further flight fan disks that do not meet the ultrasonic inspection criteria defined in paragraph 2.B.(2) (d) 8b of the SB, and replace with a serviceable part.

(ii) Remove from service within 50 CIS, fan disks that meet the ultrasonic inspection criteria defined in paragraph 2.B.(2) (d) 8b of the SB, if the wear measurement is greater than or equal to 9 mils.

(2) Install dampers, as required, in accordance with the compliance times and criteria described in section 1.D.(1)(b)2 of the SB.

Wear Measurement (Thrust Rating Category B, Regardless of Whether the Engine was Previously Operated at Thrust Rating Categories A or C)

(c) For CFM56-3B and -3C series engines operating at the category B thrust rating on the effective date of this AD, regardless of whether the engine was previously operated at thrust rating categories A or C, perform a one-time fan disk dovetail wear measurement in accordance with section 2.B.(1) of CFMI CFM56-3/-3B/-3C Service Bulletin (SB) No. 72-854, Revision 1, dated August 7, 1998, or section 2.B.(1) of CFMI CFM56-3/-3B/-3C SB No. 72-854, Revision 2, dated November 29, 1999, using the intervals defined in section 1.D.(1)(a)(1) and 1.D.(1)(a)(2) of the SB's, and the current fan disk time and cycles on the effective date of the AD.

Inspection

(1) Perform a local ultrasonic inspection for cracks in the fan disk in accordance with section 2.B.(2) of the SB, if required by the wear criteria described in section 1.D.(1)(c) of the SB.

Removal

(i) Remove from service prior to further flight fan disks that do not meet the ultrasonic inspection criteria defined in paragraph 2.B.(2) (d) 8b of the SB, and replace with a serviceable part.

(ii) Remove from service within 50 CIS, fan disks that meet the ultrasonic inspection criteria defined in paragraph 2.B.(2) (d) 8b of the SB, if the wear measurement is greater than or equal to 9 mils.

(2) Remove and replace fan blades and install dampers, as required, in accordance with the compliance times and criteria described in section 1.D.(1)(c) of the SB.

Wear Measurement (Thrust Rating Category C, Regardless of Whether the Engine was Previously Operated at Thrust Rating Categories A or B)

(d) For CFM56-3C series engines operating at the category C thrust rating on the effective date of this AD, regardless of whether the engine was previously operated at category A or B thrust ratings, perform a one-time fan disk dovetail wear measurement in accordance with section 2.B.(1) of SB CFMI CFM56-3/-3B/-3C, No. 72-854, Revision 1, dated August 7, 1998, or section 2.B.(1) of SB CFMI CFM56-3/-3B/-3C SB, No. 72-854, Revision 2, dated November 29, 1999, using the intervals defined in section 1.D.(1)(a)(1) and 1.D.(1)(a)(2) of the SB's and the current fan disk time and cycles on the effective date of the AD.

Inspection

(1) Perform a local ultrasonic inspection for cracks in the fan disk in accordance with section 2.B.(2) of the SB, if required by the wear criteria described in section 1.D.(1)(d) of the SB.

Removal

(i) Remove from service prior to further flight fan disks that do not meet the ultrasonic inspection criteria defined in paragraph 2.B.(2) (d) 8b of the SB, and replace with a serviceable part.

(ii) Remove from service within 50 CIS, fan disks that meet the ultrasonic inspection criteria defined in paragraph 2.B.(2) (d) 8b of the SB, if the wear measurement is greater than or equal to 5 mils.

(2) [Reserved]

Cleaning and Lubrication of Fan Disk/Blade

(e) If the fan disk is determined to be serviceable, clean and lubricate the fan disk and fan blades using the instructions in paragraph 2.B.(2)(d) 8 d of the SB.

Definitions

(f) The category A, B, and C thrust ratings listed in paragraphs (a) through (d) of this AD are defined in chapter 05 of the CFM56-3 model series Engine Shop Manual, CFMI-TP.SM.5.

Lubricants

(g) After the effective date of this AD, the following lubricants are no longer approved for use on the CFMI CFM56-3, -3B, and -3C series engines: Sandstrom 27A, ZIP D5460, Surf-kote A 1625, Tiolube 70 and Tiolube 75/75.

When Inspection is NOT required

(h) The actions required by paragraphs (a), (b), (c), and (d), (e) of this AD are not required if the fan disk has been equipped with configurations (1) or (2) below prior to reaching 3,000 cycles-since-new, or 5,250 hours-since-new, whichever occurs first, and has never been relubricated using one of the lubricants identified in paragraph (g) of this AD:

(1) For fan disks operating at a thrust rating of 20,000 pounds or less, the fan disk has either 25° fan blades with dampers or 37° fan blades with or without dampers.

(2) For fan disks operating at a thrust rating of more than 20,000 pounds, the fan disk has 37° fan blades with dampers.

(i) Inspection is not required for fan disks that used lubricants identified in paragraph (g) but were then rebroached prior to exceeding the .004 inch wear limit, then were not lubricated with the lubricants identified in paragraph (g) AND were equipped with fan blade configurations specified either in sub-paragraph (h) (1) or (h)(2).

(j) Inspection is also not required for fan disks that were inspected to and within Engine Shop Manual limits of .004 inch wear limit, then were not lubricated with the lubricants identified in paragraph (g) AND were equipped with fan blade configurations specified either in sub-paragraph (h)(1) or (h)(2).

When Inspection can wait until 20,000 cycles-since-new (CSN)/ 35,000 time-since-new (TSN)

(k) For disks that have never been relubricated since first manufacture using one of the lubricants identified in paragraph (g) of this AD, the inspections required by paragraphs (a), (b), (c), and (d) of this AD are required at 20,000 CSN or 35,000 hours TSN, whichever occurs first.

Alternative Methods of Compliance

(l) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Engine Certification Office (ECO). Operators shall submit their request through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, ECO.

Note 3: Information concerning the existence of approved alternative methods of compliance with this airworthiness directive, if any, may be obtained from the ECO.

Ferry Flights

(m) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the aircraft to a location where the requirements of this AD can be accomplished.

Incorporation By Reference Material

(n) The FAA has reviewed and approved the technical content of the listed CFMI SBs. The actions required by this AD shall be done in accordance with the following CFMI SBs:

Document No.	Pages	Revision	Date
CFM56-3/-3B/-3C SB No. 72-854	1-39	1	August 7, 1998
Total pages: 39			
CFM56-3/-3B/-3C SB No. 72-854	1-40	2	November 29, 1999
Total pages: 40			

The incorporations by reference were approved by the Director of the Federal Register in accordance with 5 U.S.C. 552 (a) and 1 CFR part 51. Copies may be obtained from CFM International, Technical Publications Department, 1 Neumann Way, Cincinnati, OH 45215; telephone: (513) 552-2800, fax: (513) 552-2816. Copies may be inspected at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA 01803-5299; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

Effective Date

(o) This amendment becomes effective on April 4, 2001.

FOR FURTHER INFORMATION CONTACT: Glorianne Niebuhr, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7132, fax (781) 238-7199.

Issued in Burlington, Massachusetts, on February 12, 2001.

Jay J. Pardee, Manager, Engine and Propeller Directorate, Aircraft Certification Service.